

CLAIMS

We claim:

1. A host cell containing a recombinant DNA molecule which comprises an array of three or more tRNA genes, wherein said tRNA genes correspond to codons that are rarely used in said host cell.

2. The host cell of claim 1, wherein said tRNA genes correspond to codons present in a gene from an organism other than said host cell.

3. The host cell of claim 1, wherein one or more of said tRNA genes are heterologous to said host cell.

4. The host cell of claim 1, wherein said host cell further comprises a recombinant DNA molecule which comprises a gene encoding a protein of interest.

5. The host cell of claim 1, wherein said array of tRNA genes is operatively associated with a transcription control element operative in said host cell.

6. The host cell of claim 5, wherein transcription of said tRNA genes is activated by IPTG.

7. The host cell of claim 1, wherein transcription of said tRNA genes is controlled by a promoter for T7 RNA polymerase.

8. The host cell of claim 1 which is protease deficient.

9. The host cell of claim 8 which is deficient in Lon and OmpT proteases.

10. The host cell of claim 1 wherein said recombinant DNA molecule comprises a medium to low copy number vector.

11. The host cell of claim 10, wherein said array comprises the *E. coli* genes *argU* and *ileY*.

5 12. The host cell of claim 11, wherein said array further comprises the *E. coli* gene *leuW*.

13. The host cell of claim 12, wherein said array further comprises the *E. coli* gene *proL*.

10 14. The host cell of claim 10, wherein said array comprises the *E. coli* genes *argU* and *proL*.

15. The host cell of claim 1 which is a bacterial cell.

16. The host cell of claim 15, wherein said bacterial cell is an *E. coli* cell.

17. The host cell of claim 16 which has an Hte (high transformation efficiency) phenotype.

15 18. The host cell of claim 16 which is EndA1 deficient.

19. The host cell of claim 16 which is RecA positive.

Sub
a1
20. The host cell of claim 16 which has an Hte phenotype and is EndA1 deficient, Lon deficient, OmpT deficient, and RecA positive.

21. The host cell of claim 20, wherein transcription of said tRNA genes is controlled by a promoter for T7 RNA polymerase and activated by IPTG.

22. A vector that replicates in a host cell, said vector comprising an array of three or more tRNA genes which correspond to codons that are rarely used in said host cell.

5 23. The vector of claim 22, wherein said array of tRNA genes is operatively associated with a transcription control element operative in said host cell.

24. The vector of claim 23, wherein transcription of said tRNA genes is activated by IPTG.

10 25. The vector of claim 22, wherein transcription of said tRNA genes is controlled by a promoter for T7 RNA polymerase.

26. The vector of claim 22, wherein said host cell is a bacterial cell.

27. The vector of claim 26, wherein said bacterial cell is an *E. coli* cell.

28. The vector of claim 22, wherein said array comprises the *E. coli* genes *argU* and *ileY*.

15 29. The vector of claim 28, wherein said array further comprises the *E. coli* gene *leuW*.

30. The vector of claim 29, wherein said array further comprises the *E. coli* gene *proL*.

31. The vector of claim 22, wherein said array comprises the *E. coli* genes *argU*

and *proL*.

32. The vector of claim 22 which comprises a restriction endonuclease site located between the coding sequences of any two tRNA genes.

5 33. A method of producing a protein of interest, comprising the step of culturing a host cell containing a recombinant DNA molecule that comprises an array of three or more tRNA genes, wherein said tRNA genes correspond to codons that are rarely used in said host cell, wherein said codons are present in the gene for the protein of interest, and wherein the conditions of culturing said host cell are sufficient to produce said protein of interest.

10 34. The method of claim 33, wherein said protein of interest is heterologous to said host cell.

35. The method of claim 33, further comprising the step of producing said protein of interest.

15 36. The method of claim 35, further comprising the step of purifying said protein of interest.

37. A kit comprising a vector and a host cell and packaging materials therefor, wherein said vector replicates in said host cell, and wherein said vector comprises an array of three or more tRNA genes that correspond to codons that are rarely used in said host cell.

20 38. The kit of claim 37, wherein said vector comprises a restriction endonuclease site located between the coding sequences of any two tRNA genes.

39. A host cell containing a recombinant DNA molecule which comprises a set of two tRNA genes, wherein said tRNA genes correspond to codons that are rarely used in said host cell, and wherein said set does not consist of the *E. coli* genes *argU* and *ileX*.

40. The host cell of claim 39, wherein said set comprises two tRNA genes selected from the group consisting of genes that specify codons for: arginine and proline; arginine and leucine; arginine and glycine; proline and leucine; proline and isoleucine; proline and glycine; leucine and isoleucine; leucine and glycine; isoleucine and glycine;

41. The host cell of claim 40, wherein said set comprises *argU* and *proL*.

42. A vector that replicates in a host cell, said vector comprising a recombinant DNA molecule which comprises a set of two tRNA genes, wherein said tRNA genes correspond to codons that are rarely used in said host cell, and wherein said set does not consist of the *E. coli* genes *argU* and *ileX*.

43. A method of producing a protein of interest, comprising the step of culturing a host cell that comprises the recombinant DNA molecule of claim 38, wherein said codons are present in the gene for the protein of interest, and wherein the conditions of culturing said host cell are sufficient to produce said protein of interest.

44. A kit comprising the vector of claim 42 and a host cell and packaging materials therefor, wherein said vector replicates in said host cell.